Managing Risk For Cassini During Mission Operations & Data Analysis

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Today's space flight projects are faced with an environment that is driven by both challenging technical and science requirements as well as tight schedules and resource limitations. By nature, these challenges introduce risks that could potentially impact the degree to which today's projects satisfy their high level mission requirements and objectives. A proactive Risk Management Process is not only required by NASA and JPL, but its effective implementation is critical to increasing the likelihood of achieving mission success.

Risk is defined as the likelihood of an undesirable event (programmatic, technical, mission, safety, etc) occurring and the severity of the consequences of the occurrence. Risk Management is a continuous process that occurs throughout the project lifecycle, to proactively identify, assess, track and control risks before they become problems.

The Cassini Mission to Saturn was launched on October 15, 1997 from the Kennedy Space Center and is now in the Mission Operations and Data Analysis Phase (MO&DA) of the mission. Since Launch, Cassini has completed one Earth, two Venus and one Jupiter gravity assist fly-by and is now en-route to Saturn, with Saturn Orbit Insertion (SOI) scheduled for July 2004. Cassini will release the Huygens Probe at the moon Titan, approximately seven months after SOI and will continue on a four year tour of the Saturnian System. The Mission Plan has been established, maneuvers have been well thought out and encounters with Saturn's orbiting moons are scheduled. Unlike projects in the Development Phase, Cassini does not possess risk mitigation options to slip the launch date, trade resource margins such as mass, power and performance or delay a critical test to deal with hardware problems. Plans for the Cassini Mission are mature and any alterations would pose potentially serious impacts to other resources.

A Risk Management Process has been tailored for Cassini that not only satisfies the requirements of NASA and JPL, but allows the Project to proactively identify and assess risks that threaten Mission Objectives. Risk Management on Cassini is a team effort that involves the entire flight team, from management to engineering staff. Everyone on the Cassini flight team must take ownership and be responsible for Risk Management and Mission Success. While the process is managed and facilitated by the Cassini Mission Assurance Manager, it involves regular interactions with the Program Staff and team members to instill the Risk Management Philosophy into the day to day operations.

Aside from regular workshops with the Program Staff and team members, a JPL institutionally supported web-based tool has been tailored to facilitate risk identification, assessment, tracking, control, reporting and metrics generation. Metrics generated by this tool are utilized to ensure that the Risk Management Process remains on-track and provides value for the dollars spent.

This paper will describe the Cassini Risk Management Process as it is being implemented today, specifically for Mission Operations. The Risk Management effort, described in this abstract, was carried out by the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.